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Synopsis of North American Amaranthaceæ. V. (Concluded.)

EDWIN B. ULINE AND WILLIAM L. BRAY.

IRESINE L. Gen. Pl. n. 1113. 1737.

Lithophila Sw. Prod. Veg. Ind. Occ. 14. 1788.

Phloxerous R. Br. Prodr. Flor. Nov. Hol. 1: 416. 1810.

Tromsdorfia Mart. Nov. Gen. et Spec. Bras. 2: 40. 1826.

Hermaphrodite, polygamo-diœcious or diœcious herbs, shrubs or shrubby trees, the latter attaining a height of six meters, with opposite usually petioled leaves, scarious whitish 3-bracted flowers crowded into clusters or spikes in a branching paniculate inflorescence: calyx of five sepals which in ♂ and ♀ flowers are generally almost hidden in long wool which springs from the base of the flower: stamens five; filaments united into a shallow cup at base and bearing staminodia in most species: utricle globular, ovate or urn-shaped with short style and two slender often filiform stigmatic branches.

In this synopsis of the genus *Iresine* we have followed the plan stated previously of including such Mexican and Central American species as were found to be well represented in the herbaria of the United States, so that while we reduce the forms found in the United States to *Iresine vermicularis* (L.) Moq. and *Iresine paniculata* (L.) Kuntze, with its two varieties, there are here included some eleven other tolerably well defined species from Mexico and Central America, four of which we venture to describe as new, knowing well that a more thorough acquaintance with the Iresines of those regions may show us to be in error. As a matter of interest we would call attention here to the rather surprising fact that from Honduras and Guatemala Iresines are reported which are actually shrubby trees and in one case a small tree six meters in height.

* *Hermaphrodite.*

← *Inflorescence capitata.*

IRESINE VERMICULARIS (L.) Moq. DC. Prodr. 13²: 340. 1849.

Gomphrena vermicularis L. Sp. 224. 1737. no. 6.

Phloxerous vermicularis R. Br. Prodr. Flor. Nov. Hol. 1: 410. 1810.

Low fleshy seaside herbs with narrow sessile leaves, capi-

tate inflorescence and ♀ flowers: sepals five, unequal, the flower flattened dorso-ventrally: stamens five, staminodia none.

Florida, West Indies, Guiana, Brazil; also on lower Rio Grande and in Panama.

On the supposition that the specimens examined were accurately named, this will embrace *Iresine portulacoides* (St. Hil.) Moq. l. c. and *Iresine aggregata* (Willd.) Moq. l. c. With our present view of Iresines, the descriptions in DC. Prodr. 13²: 340, 341 do not indicate satisfactory specific differences.

+ + *Inflorescence paniculate.*

***Iresine completa*, n. sp.**

Shrubby, with rather dense appressed grayish pubescence: leaves long and narrow elliptical-lanceolate, glabrous except the under surface of young and midrib of older leaves, these and the stem blackish in the dried specimens: inflorescence a narrow panicle with short strictly opposite branches and branchlets, each pair subtended by short acute scarious bracts, or by reduced leaves lower on the main axis; spikelets pedicellate in the axils of bracts, or terminal on the ultimate branchlets: flowers ♀, rather large, 2.5^{mm} long, bracts broadly ovate, less than half the length of the perianth: calyx with glabrous sepals, nerved and with scarious margins, on a distinct pedicel from which arises a dense growth of long woolly hairs: utricle as in the next species, from which this differs in its complete hermaphroditism, pubescence and narrower inflorescence with opposite arrangement: stamen cup rather deep and the staminodia prominent.

Honduras, San Pedro Sula, Dr. Carl Thieme no. 338 (1888). Type in John Donnell Smith herbarium.

IRESINE ELATIOR Rich. in Willd. Sp. Pl. 4: 766.

Rosea elatior Mart. Nov. Gen. et Spec. Bras. 2: 59. pl. 155. 1826.

Stem herbaceous, erect, striated, glabrous: leaves oblong-lanceolate and narrower: panicle pyramidal; spikelets alternate, short pedicellate; flowers ♀: staminodia present but very minute: utricle orbicular.

Mexico, Lower California, Central America, West Indies.

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* * *Polygamo-diœcious.*

+ *Shrubs or shrubby trees.*

Iresine nigra, n. sp.

Shrubs, sometimes shrubby trees, undergrowth in forests, turning black on drying, glabrous except among the flowers: leaves much as in the preceding but thicker, smaller and with longer petioles: inflorescence a lax panicle with very long, slender alternate branches loosely set with small spikelets, which are pedunculate only at the base of branches: flowers sometimes ♀, but apparently generally unisexual by failure of pollen or ovules to mature, some plants being prevailingly pistillate, others staminate: bracts and sepals in ♀ and ♀ flowers as in the preceding, but the flowers are smaller, 1.5^{mm} long; in those flowers which are more conspicuously staminate the sepals are longer, narrowly oblong, somewhat pilose, but the woolly growth from the base is inconspicuous: utricle top-shaped, narrowed below into a stalk-like base and above into a short style with two long filiform stigmatic branches: staminodia very minute.

Honduras, San Pedro Sula, *Dr. Carl Thieme* nos. 312, 314 (1888) 1061, 38 (1887); Guatemala, *Heyde & Lux* 4573 (1893); Orizaba, *Botteri* 990. Types in J. D. S., Coulter, and Gray herbaria.

Iresine arbuscula, n. sp.

A small tree 4.5 to 6^m high with large oblong-elliptical green leaves 14–21^{cm} long including petiole 3–4^{cm} long; branches and petioles black in dried specimens: inflorescence a pedunculate naked drooping panicle at the ends of leafy branches, the larger branches of the panicle subtended by scarious bracts, never by reduced leaves as in *I. paniculata* which it resembles considerably in inflorescence; branches of inflorescence long, filiform, not divaricate: spikelets very small and closely set along the ultimate branchlets; rhachis short woolly, but pedicel of flower little hairy. The specimen examined seems to be staminate, although the utricle is so largely developed as to possess papillate stigmatic branches so that there is no apparent reason why seed should not be produced, but the flowers seem to fall off after anthesis. Staminodia rather prominent, long and broad.

Guatemala, Volcan Tecroamburro, Santa Rosa, *Heyde & Lux* 4570. (1893).

+ + *Herbaceous or suffruticose.*

Iresine jaliscana, n. sp.

Herbaceous or suffruticose with green stems longitudinally ridged: leaves green, small, ovate-lanceolate, 3 to 8^{cm} long including petiole, appearing in fasciculate clusters at the nodes, these and the stem glabrous except on the very youngest growths: inflorescence a lax mostly leafless panicle with very slender branches, those of the second order long divaricate, bearing pedicelled spikelets mostly on one side; rachis of spikelets woolly, bracts acuminate, nearly as long as the sepals: sepals membranous, narrowly oblong; calyx slightly pedicellate with comparatively inconspicuous hairiness at base: in ♀ flowers the stamen cup is present bearing five imperfect stamens and very minute staminodia: utricle flat top-shaped, terminating above in a short style with two filiform stigmatic branches: ♂ plants not seen.

Mexico, state of Jalisco near Guadalajara, Palmer no. 92 (1886). Types in Columbia College, U. S., and John Donnell Smith herbaria.

* * * *Diaceous.*

+ *The whole plant (except older woody portions) densely white or gray tomentose.*

++ *Staminodia papillate, i. e., dissected into fine hair-like processes.*

IRESINE CANESCENS Humb. et Bonpl. in Willd. Sp. Pl. 4: 765.

Tromsdorfia canescens Mart. Nov. Gen. et Spec. Bras. 2: 42. 1826.

Distinguished by its sub-pyramidal very profuse paniculate inflorescence. The male flowers have prominent but abortive utricles showing even rudiments of stigmatic lobes: the staminodia are prominent and finely dissected into hair-like papillæ. In the female flowers the white woolly growth from the lower portion of calyx lobes and base of the flower is unusually conspicuous and dense.

Mexico, Lower California, Central America.

IRESINE CASSINÆFORMIS Schauer in Linnaea 19: 708. 1847.

Determined by Sereno Watson, who notes, "imperfectly agreeing with the description." It has the flower characters of *I. canescens* but differs in habit, being more woody, with nar-

rower thicker leaves which are white tomentose beneath: the branches of female inflorescence are condensed into narrow panicles much less profuse than in typical *I. canescens*, of which it is possibly only a form.

Mexico, Monterey, *Palmer* 1133 (1880).

IRESINE SCHAFFNERI Wats. Proc. Amer. Acad. **21**: 437. 1886.

Suffrutescent: panicles mostly long pedunculate, the spikelets sessile and somewhat crowded upon the short branches: female flowers as in *I. canescens*: male flowers more pubescent on the sepals and longer bracted. The long pedunculate panicles seem to distinguish this plant from the two preceding.

Mexico. Types in Gray, J. D. S. and Columbia College herbaria.

++ ++ *Staminodia* entire.

IRESINE PRINGLEI Wats. Proc. Amer. Acad. **25**: 161. 1890.

Shrubby, finely tomentose, the very young leaves densely white tomentose, becoming bright green and nearly glabrous above and thinly tomentose beneath, lanceolate: sepals of female flowers rigid, 1^{mm} long, acuminate, spreading tips, a prominent bright green mid-nerve and white margins, very woolly, especially near the base. The species is well marked by the peculiar calyx of the female flower.

Reported from several states in northern Mexico. Types in Gray, J. D. S., and Columbia College herbaria.

IRESINE LATIFOLIA Benth. & Hook. Gen. Pl. **3**: 42. 1883.

Alternanthera latifolia Moq. l. c. 351. 1849.

Gomphrena latifolia Mart. & Gal. Bull. Acad. Brux. (Reprint p. 9). 1843.

Iresine laxa Wats. Proc. Amer. Acad. **21**: 454. 1886.

Suffruticose or woody, tomentose, leaves from broadly ovate to ovate-lanceolate, those on the flowering branches narrower and reduced: panicle more diffuse than in *I. canescens*, with flowering branches slenderer and more lax: flowers aggregated in spikelets, alternate and pedunculate along the opposite branchlets of the diffuse panicle: sepals of male flowers short hairy: staminodia long and narrow, not papillate: sepals of female flowers thin, densely long woolly. Those

specimens described as *I. laxa* by Watson are like certain specimens which he called *I. latifolia*, agreeing also with those sheets from other herbaria labelled *I. latifolia*, which leads us to believe there is no distinction of species here.

Mexico, Lower California.

+ + *Plants mostly glabrous.*

IRESINE INTERRUPTA Benth. Bot. Voy. "Sulphur" 156. 1844.

Alternanthera Richardii Moq. l. c. 353. 1849.

Suffruticose, erect, glabrous: leaves bright green and also glabrous: primary branches of inflorescence opposite and widely divaricate; secondary alternate, loosely set with spikelets of small unisexual flowers, the rachis and base of the flowers pilose: staminodia broad, dentate at summit.

Mexico.

IRESINE PANICULATA (L.) Kuntze Rev. Gen. Pl. 454. 1891.

Iresine celosioides L. Sp. Pl. 1456. 1762.

Mostly glabrous erect annuals or perennials according to habitat, those of the southwestern desert regions with stronger tendency to the latter: stem nerved or angled, often swollen at the joints; plant diffusely branching, often with small undeveloped branchlets in the axils of leaves: leaves petioled, tapering at both ends, ovate to lance-linear: inflorescence paniculate, always with reduced green leaves subtending the larger branches; spikelets oblong or linear, seldom pedicellate and never properly glomerate: in the male flowers there are mostly five stamens (sometimes only three?): staminodia if present very minute: usually no rudimentary ovary: sepals of female flowers 3-nerved, woolly: stamen cup exceedingly rudimentary, with five lobes indicating rudimentary stamens by their position: no ♀ flowers: polygamous plants have not been seen. The most clearly marked diœcious species of the Iresines.

Widely distributed over the southern half of the United States from Atlantic coast to New Mexico and south. Not reported north of Kentucky, Arkansas and southern Kansas.

IRESINE PANICULATA, var. **Floridana**, n. var.

Diffusely branching from a woody base, branches ascending and equal: roots long and fleshy: nodes crowded, less than

3^{em} apart: leaves small and crowded: pistillate flowers clothed with long, straight, white wool.

Anastasia Island, Fla., Miss Mary C. Reynolds, 1875.

Labeled *I. diffusa* in J. D. S. herb. and *I. flavescens* in Columbia Coll. herb. Types in above herbaria.

IRESINE PANICULATA, var. **OBTUSIFOLIA** Coulter Bot. West. Tex. 364. 1894.

Lower leaves smaller, ovate or broadly spatulate, obtuse, more scabrous, especially beneath on the prominent white veins: panicle narrower, more leafy.

The species shades gradually into this variety, which however may stand as the type of a departure from the normal quite general among the southwestern forms.

Western Texas to Chihuahua.

Since *Iresine paniculata* is so widely distributed, it is naturally found to vary considerably in specific characters, so much so that without a large number of specimens for comparison one would be inclined to choose out certain forms for specific distinction. But with the large amount of material from various regions at our disposal there seems abundant reason to say that the following forms are to be included in the synonymy of *I. paniculata*.

Iresine flavescens Humb. et Bonpl. ex Willd. Sp. Pl. 4: 766.

Alternanthera flavescens Moq. l. c. 350. 1849.—Those plants called *A. flavescens* Moq. by Chapman, and others so labeled (probably on the strength of Chapman's determinations) may be referred to *I. paniculata*. It is not certain that Chapman's type is identical with the original, but it accords well with the descriptions.

Iresine diffusa Humb. et Bonpl. l. c. 4: 765.—Nuttall's plant which Moquin has cited under *I. diffusa* is identical with our specimens called *I. flavescens*.

Iresine gracilis Mart. and Gal. Bull. Acad. Brux. 10: 347. 1843.—Here again all the specimens examined may be referred to *I. paniculata*. We are bound to say however that while we feel warranted in the present disposition of these species, we lack the important evidence of an examination of the types. These are not in American herbaria.

DICRAURUS Hooker f. Benth. et Hook. Gen. Pl. 3: 42. 1883.

Apparently differing from the shrubby Iresines only by its

alternate leaves. Not completely dioecious as previously described, for some plants have ♀ flowers. Staminodia present in all the flowers, papillate.

In this genus, as in *Iresine*, there are characteristic male and female inflorescences differing obviously from each other. Occasionally in both genera one finds a plant in which the characteristic male flower has a functional utricle, but more often the female flower is found producing functional stamens. In one of the *Dicraurus* specimens (Nealley, Chenates region Western Texas [1889] Coulter herb.), although the plant is evidently of the female type, all the flowers have from two to five pollen-bearing stamens.

DICRAURUS LEPTOCLADUS Hook.f., l. c.

Leaves very small, ovate or ovate-lanceolate, 12–25^{mm} long. Flowering branches rather long and stout, with compact inflorescence. *I. alternifolia* var. *Texana* Coulter. Referred to above as having ♀ flowers.

Western Texas and Mexico.

DICRAURUS ALTERNIFOLIA (Wats.).

Iresine alternifolia Wats. Proc. Am. Acad. 24: 72. 1889.

Leaves larger, ovate or oblong, truncate or cuneate at base, occurring in fascicles which subtend the flowering branches, these being short, slender and divaricate, much branched: flowers smaller than in the preceding, the female with more conspicuous woolliness.

Mexico, Guaymas, Palmer 276 (1887).

In concluding the synopsis of North American Amaranthaceæ we append a brief account of two genera which were not included in order, earlier in the revision; namely, *Celosia* and *Acanthochiton*.

CELOSIA L. Gen. Pl. no. 289. 1737.

Distinguished from our other genera by its two to several seeded utricle.

CELOSIA PANICULATA L. Sp. Pl. 206. 1753.

Our most common species. Florida, Southern Texas, Mexico.

CELOSIA PALMERI Wats. Proc. Amer. Acad. **18**: 143. 1883.

Differing from *C. paniculata* in foliage, inflorescence and broader and less acuminate bracts and sepals.

North Mexico.

CELOSIA FLORIBUNDA Gray Proc. Amer. Acad. **5**: 167. 1861.

Very distinct in foliage and its abundant compact inflorescence.

Lower California.

ACANTHOCHITON Torr. Bot. Sitgr. Rep. 170. *pl. 13*. 1893.

A monotypic genus between *Amaranthus* and *Acnida*. Dicæcious; distinguished by the remarkable bract development in the ♀ flowers.

ACANTHOCHITON WRIGHTII Torrey. l. c.; also in Bot. Mex.
Bound. 179. 1859.

Texas.

Herbarium Lake Forest University.